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# SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE



Optical Maser

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## NUTRITION

# India Diet Study Made

THE SOLUTION to India's dietary problems lies in increasing "protective foods" rather than stepping up production of rice, wheat and other grains.

This is the belief of Dr. Wendell Griffith, nutrition authority of the University of California, Los Angeles, who has just returned from a year's study of such problems in India, where he represented the United Nations Food and Agriculture Organization and the Children's Fund.

Indians need to produce and consume additional amounts of milk and dairy products, legumes (grams, peas, etc.), flour from oil seeds such as peanuts and sesameum, leafy green and yellow vegetables, citrus and other fruits for the vegetarians and eggs, poultry, fish and meats for non-vegetarians.

Multiple cropping and improved agri-

cultural practices would give such increased amounts of protective foods.

An extensive nutrition education program is also needed to persuade the people to use more protective foods in their daily fare. Food habits are formidable, even those having no religious basis, and there must be a strong incentive for the consumer to accept changes in his accustomed diet.

An immediate need is something to counter protein malnutrition, especially prevalent among infants and small children. This cannot, in Dr. Griffith's opinion, await development of an adequate supply of safe milk.

One solution is the making of gruels for the children from legumes and peanuts. These foods are available to most families if mothers can be educated to make gruels from them.

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## ASTRONOMY

# Stars Cannot Hide Age

IF STARS were like many women in hiding their ages, they would have to hide from earthly telescopes, so ancient are they.

However, they cannot now hide their years because Dr. Bengt Stromgren of the Institute for Advanced Study, Princeton, N. J., has developed a new method for finding the ages and distances of stars.

It can be applied to hundreds of thousands of stars using telescopes no larger than the 36-inch reflector now in operation at the Kitt Peak National Observatory in Arizona.

From such observations will come much new information on the precise shape and composition of the Milky Way galaxy in which the sun and its planets are located. By applying the new method, astronomers should also learn about the arrangement in space of stars of varying ages and physical characteristics.

There is also the possibility, using the 200-inch telescope atop Mt. Palomar and the 120-inch at Mt. Hamilton, Calif., of investigating the physical similarities and differences of stars in the Milky Way galaxy compared to stars in other, nearby galaxies.

These are the predictions made by Dr. W. W. Morgan, director of the University of Chicago's Yerkes Observatory, Williams Bay, Wis., in *Science*, 132:73, 1960.

Dr. Morgan also predicted that the characteristics of the average stellar population for galaxies far beyond the Milky Way would be determined from studies of their shapes. Galaxies are clusters of countless millions of stars, such as the Milky Way, and there are unnumbered millions of galaxies.

The new method by which a star's age and distance are found depends on precise measurements of a star's radiation within certain narrow, especially selected regions

of the rainbow-hued spectrum of light. From these measurements, Dr. Stromgren can determine the true brightness, or candle power, of the star. From its luminosity, its age can be determined.

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## TECHNOLOGY

# Glass Shields Made For Mercury Capsule

THIN SHIELDS of glass will be used on the Mercury capsule in which one of the U. S.'s seven astronauts will orbit the earth. Corning Glass Works at Corning, N. Y., reported that the firm is making the shields to protect transmitting and receiving antennas but permit their radio signals to pass. The firm's 96% silica glass will form a ring about the neck of the capsule. This glass will not break even when plunged from high heat into icy water.

Radio signals streaming back to earth through the antenna shields will carry critical information about the chosen astronaut's heart rate, blood pressure and body temperature. The signals will also send data on the satellite's operation.

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## ARCHAEOLOGY

# Skeleton of Indian Woman Found

AMATEUR ARCHAEOLOGISTS uncovered the intact skeleton of an Indian woman at the site of an Indian village once located along the Potomac River, about 25 miles north of Washington, D. C. The skeleton, the tenth discovered since last July by members of the Southwest Chapter of the Archaeological Society of Maryland, will be turned over to the Smithsonian Institution for further study.

Pioneer work has been done by these amateur archaeologists in uncovering material that will eventually enable experts to identify and describe a hitherto unknown Indian group—or perhaps two groups. At the level at which the skeletons were uncovered, potsherds, tools and arrowheads were found which definitely point to a woodland culture. Arrowheads and pottery found at a lower level were of a very different type, and indicate a transitional culture bridging an archaic and a woodland culture.

The transitional culture may date back as far as 1000 B.C. The woodland culture flourished, it is estimated, 500 to 1,000 years ago.

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## TECHNOLOGY

# Nuclear Turbine Planned For Electricity in Space

THE AIR FORCE has ordered a 300,000-watt nuclear-powered turbine for use in space—the largest space power project ever undertaken by the United States.

The system is planned to have a potential of being developed into a million-watt unit. Called "Spur," the unit will weigh about eight pounds per 1,000 watts of power produced—2,400 pounds for the first power station and 8,000 pounds for the million-watt unit.

Under the Air Force contract with Garrett Corporation's AiResearch Manufacturing Division of Arizona, the small atomic reactor will supply electricity for space needs. A turbine engine will convert the atomic energy to usable mechanical power.

Unlike conventional engines, the space turbine will constantly recirculate liquid metal. The Atomic Energy Commission and the Wright Air Development Division in Dayton, Ohio, will jointly manage the Spur project.

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## ACOUSTICS

# Baffling Sound Problem Solved

ACCURATE PREDICTION of reverberation in large halls used for music, a problem that has puzzled acoustical scientists for 60 years, has now been solved. Dr. Leo L. Beranek, president of Bolt Beranek and Newman, Inc., Cambridge, Mass., found that the location and spacing of an audience, not just the number of persons in a hall, helps to forecast the correct reverberation time. Reverberation, the lingering of sound in a hall after the originating sound has ceased, is an important factor in the quality of a hall's acoustics.

Dr. Beranek and his associates studied more than 50 of the world's most famous concert halls and opera houses in 15 nations during the past five years. The best reverberation time for concert halls is from 1.8 to 2.1 seconds, they report in the *Journal of the Acoustical Society of America*, an official publication of the American Institute of Physics in New York.

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## MEDICINE

# TB as Cancer Treatment?

Artificially induced bacterial infections such as tuberculosis seem promising as treatment for cancer. But no definite conclusions can yet be made.

TUBERCULOSIS could possibly be used as a "treatment" for cancer. No one is making definite statements, but Dr. Louis Perner of Swedish Hospital in Brooklyn, N. Y., believes the possibilities of using artificially induced bacterial infections such as tuberculosis should be studied.

The idea of using one disease to fight another is not new. The fever of malaria has been used to "burn up" syphilis parasites.

In 1891, Dr. W. B. Coley tried to produce erysipelas, an infection caused by *Streptococcus pyogenes*, in ten patients with inoperable cancer. But the procedure was difficult and dangerous so he began to experiment with mixed bacterial toxins.

Patients are still alive who have recovered from inoperable sarcomas after having been treated with a toxin mixture by Dr. Coley, Dr. Perner asserts in the Journal of the American Geriatrics Society (July).

In 1916, Dr. W. M. Dabney gave tuberculin to seven cancer patients. One showed "remarkable" improvement, which continued after three months of tuberculin

therapy, and another showed "unexpected improvement."

"Unfortunately," Dr. Perner states, "no further follow-up was undertaken, so the outcome of this . . . therapy is unknown."

Another report in the Journal states that more new cases of pulmonary tuberculosis are now being found in persons past 50 than in any other age group.

Dr. Harry B. Greenberg, instructor in medicine at Tulane University, New Orleans, La., says active tuberculosis in the aged often is obscured by other old-age symptoms, such as chronic bronchitis or cardiovascular disease. Often it is discovered only when a younger member of the family gets the disease, and a search is made for the source.

Resistance to TB is decreased in old age; therefore, the death rate is higher. Because the disease runs a milder, less explosive course in the elderly, it may be overlooked as the cause of death, which may be attributed instead to a degenerative disease.

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## AEROMEDICINE

# Legless Space Travelers

LEGLESS YOUNG MEN otherwise in good physical condition can be trained for space flight and, theoretically, may be even better qualified for pioneer space missions because of their disability. However, a space flight training program for amputees is not, at this time, either probable or economically practical.

The possibility of employing a qualified double amputee for pioneer space efforts was suggested to SCIENCE SERVICE by Col. John Paul Stapp, chief of Aeromedical Laboratory, Wright Air Development Division, Wright-Patterson Air Force Base, Dayton, Ohio.

"As far as using an amputee is concerned," Col. Stapp said, "symbolically this emphasizes the fact that man does not use legs in space and will not need them under conditions of zero gravity for locomotion. If a space pilot does not have to have legs to accomplish his mission, using a qualified amputee would save on both food and oxygen consumption as well as weight and space, all major considerations in terms of any kind of extended space travel."

Manned flights as conceived in Project Mercury under the National Aeronautics and Space Administration allow the astronaut to use his hands to work instrumentation. His legs are not used because of both lack of space and lack of need for them.

In extended flights, man will be traveling for long periods under conditions of

zero gravity. There are medical indications that leg muscles may become weak from not being used. Under weightless conditions, it is the upper part of the body which is necessary for movement and stability.

Col. Stapp observed that amputees are constantly in a stressful condition and daily living presents them with the challenge of both physical and psychological adjustment on a continuing basis.

"This may make them better able to adjust to the stresses and strains of a space venture than able-bodied men," he said.

A double amputee, an Australian veteran of World War II, who obviously was aware of the limitations put upon a legged man in space, has already volunteered to Col. Stapp for astronaut training. However, he had no background of aviation or medicine.

"His only qualification was being a double amputee," said Col. Stapp, "and, therefore, we had to send him our regrets along with our compliments for his courage in volunteering."

It takes from a year to 18 months to turn a qualified jet pilot into an astronaut with the medical background to understand the conditions anticipated by space flight medical authorities.

Col. Stapp has acknowledged that amputees with flying experience, even lacking

other necessary qualifications, could be suitably trained for space flight. He emphasized that this would mean a new and specially designed program that would require a great additional investment of time and money, "which we cannot afford, at this time, to make," even though such astronauts might prove superior.

Col. Stapp, a pioneer in space medicine, is known as "the fastest man on earth" for his rocket sled rides at 632 miles per hour. He was a volunteer on 26 tests using the rocket sled. He undertook the rides to test man's ability to withstand stresses of deceleration at high speed. His ride at 632 miles per hour culminated in an exposure of more than 41 Gs.

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## TECHNOLOGY

# One-Armed Robot Lends a Hand

A ONE-ARMED ROBOT is assisting scientists at the Esso Research and Engineering Co. laboratories in Linden, N. J. Created by Koelsch Electronic Development Co., Boise, Idaho, the electric-powered robot can manipulate delicate materials used in sensitive chemical operations at the direction of a scientist many feet away. The robot is powerful enough to hold 45 pounds at the length of its single arm.

In Esso's program to develop super rocket fuels for the Government, scientists have had to compound chemicals by remote control, outside the concrete walls of test cells. The robot can work within the cells.

The robot consists of a manipulator arm mounted on a mobile platform. The arm can be raised or lowered the length of its steel body, and the entire robot assembly maneuvers in any direction.

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**ROBOT ASSISTANT**—This one-armed robot, designed by Koelsch Electronic Development Company, Boise, Idaho, assists in research.



## MEDICINE

# Placebos Relieve Pain

PLACEBOS—inactive pills with no power except that of suggestion—are far more effective in giving relief from pain when stress is present than when the pain is induced experimentally. The same is true of certain active drugs; they are more effective in relieving pain when psychological stress is present.

A Harvard Medical School professor, Dr. Henry K. Beecher of the department of anesthesia, Massachusetts General Hospital, Boston, said in the journal *Science*, 132:91, 1960, that "unsuspected ties between mind and body" are revealed in this idea. The principle is:

Certain drugs are effective in relieving internal pain only if the psychological state of the person is anxious or stressful.

Apparently the stronger the psychological state, the more effective the drugs, Dr. Beecher said.

"Similarly, certain common symptoms, pain for example, appear to emerge only if an essential psychological state (anxiety, stress) is present. Physiological derangement (stimulation of pain endings) is not enough."

Dr. Beecher said that two general concepts grow out of this observation. Not only does the effectiveness of placebos increase with increased stress, but the effectiveness of certain active drugs does also.

Real pain, or pain of pathological origin, produces more anxiety, or stress, than does experimentally contrived pain.

Placebos have long been used by physicians to pacify their patients when no active drug was needed. More recently they have been used as controls in experiments to determine the value of medicinal substances.

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child tends to react to this information by character change or symptom formation."

He advises a thorough investigation of the child and his environment to determine the method and timing of breaking the news to him of his adopted status.

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## MEDICINE

## Contact Lenses Should Not Be Misused

MISUSE and over-use of contact lenses may cause serious complications, Dr. Richard K. Lansche, U. S. Army Medical Corps captain, told the annual meeting of the American Medical Association, Miami Beach, Fla.

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## BIOCHEMISTRY

# Study Role of Histamine

THE ROLE OF HISTAMINE, thought to be associated with allergies, is being investigated in a research program that may lead to a better understanding of this substance as it affects health and disease.

The study is being carried out under the direction of Drs. William J. Hartman and William G. Clark of the University of California Medical School, Los Angeles, and the Sepulveda Veterans Administration Hospital.

Drs. Hartman and Clark and their group recently demonstrated for the first time that histamine is produced normally in human cells by an enzyme. It had previously been thought by many to be produced by intestinal bacteria. The researchers used sterile preparations from basophils, a kind of white blood cell, obtained from patients with acute myelogenous leukemia.

Although histamine is implicated in

allergies, acute infections and inflammation, there is increasing evidence of its roles in normal body functions, the investigators point out. These may include nerve transmission, brain and heart function and production of gastric secretions. Histamine may also be involved in such growth processes as development of the foetus in pregnancy, tissue regeneration and wound healing.

The study is concerned with how the body produces and utilizes histamine in its normal processes. It is also concerned with means of blocking its production in abnormal situations such as allergies and inflammation.

Key to histamine production and a focal point in the study is the enzyme, histidine-decarboxylase, which manufactures the substance.

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## PSYCHIATRY

# Keep Adoption a Secret

DO NOT TELL a child that he is adopted—at least until he is old enough to have passed through the age of the Oedipal conflicts.

This is the advice to adoptive parents by Dr. Marshall D. Schechter, psychiatrist, of Beverly Hills, Calif., contained in the Archives of General Psychiatry, 3:21, 1960.

The Oedipus complex, as described by Freud, is the attachment of a child for the parent of the opposite sex, accompanied by envious and aggressive feelings toward the parent of the same sex. The age of Oedipal conflicts is between the ages of three and six, Dr. Schechter indicates.

The proportion of adopted children who

have to go to a psychiatrist for treatment is much higher than it is for the general population, Dr. Schechter reports.

The fears and fantasies of the adopted child are sometimes aggravated by the well-intentioned ways in which the adoptive parents try to soften the news that the child is adopted:

"We picked you out," intended to reassure the child, may really serve to suggest to his mind that his own parents did not choose him—that they abandoned him, sent him away or gave him up.

"The immature ego cannot cope with the knowledge of the rejection by its original parents," Dr. Schechter concludes. "The

## TECHNOLOGY

# Atomic Generator Tested

A COMPACT, LIGHTWEIGHT GENERATOR that can convert heat from a by-product of nuclear reactors into electricity to power advanced satellites and space probes for at least a year is being tested by The Martin Company. The conversion system unit uses no moving parts.

The generator, which is being developed in Baltimore, Md., by Martin's Nuclear Division under contract to the U. S. Atomic Energy Commission, is called SNAP 1-A (System for Nuclear Auxiliary Power). It is similar in principle to SNAP-3, a grapefruit-sized device first demonstrated publicly by President Eisenhower early last year.

SNAP 1-A is roughly egg-shaped, 34 inches long and 24 inches in diameter. Most of its dull metal surface is dotted with screw-headed caps marking the location of 277 thermocouples. The complete generator weighs 175 pounds.

The new system promises more power than any energy unit launched into space so far either by the United States or the Soviet Union. Some systems have combined solar cells with chemical batteries to build up to such wattage levels periodically, but cannot operate continuously at high power.

SNAP 1-A, unlike solar cells, would not be affected by the impact of micrometeorites in space. Operating independently of the sun, the nuclear unit would have the additional advantage of being able to produce power while in the shadow of the earth. The absence of moving parts in the conversion system greatly reduces the chances of any malfunction.

The fuel capsule of the SNAP 1-A, which will not be inserted until electrical and environmental tests of the rest of the system are completed, will be located at the very center of the generator, supported by light metal tubing. The capsule will contain tightly sealed pellets of radioactive cerium-144, which decays spontaneously, producing heat in the metal around it.

As the inner ends of the thermoelectric elements are heated, the outside ends always remain somewhat cooler, so that the difference in temperature produces a small electric current in each pair. These thermocouples are connected in series to add up to 125 watts at 28 volts. Tests being conducted now use an electrical heater to simulate the fuel.

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**SNAP 1-A—A generator capable of converting heat from atomic waste to electricity is tested by The Martin Company, Baltimore, Md.**

Research showed that magnetic influence on plant growth is greatest when seedlings are in the embryo stages, and when these embryos are oriented along an imaginary line drawn from pole to pole, rather than crosswise of the magnetic field.

When a seedling has its roots directed toward a natural or artificial south pole, both the roots and stem swell up and grow faster than usual. When turned with roots toward a north pole, the seedlings grow slower.

The work is reported by Drs. A. V. Krylov and G. A. Tarakanova of the Institute of Plant Physiology (Timiryazev Institute) of the USSR Academy of Sciences in the *Journal Fiziologiya Rasteniy*, 7:191, 1960. Translation was released by the Office of Technical Services, Commerce Department.

The physiologists say physicists have established that all substances possess magnetic properties that change as environment varies. The basis for these properties is the fundamental polarity, such as that found in the plants.

From this they conclude that magnetotropism is the key to the study of such problems as photosynthesis, the nature of heredity, the onset of malignant growth and the harmful effect of ionizing radiations.

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## PHYSICS

# Light Amplifier Operated

## See Front Cover

SUCCESSFUL OPERATION of an optical maser, a new device for greatly amplifying light beams, has been reported. Maser is an acronym for Microwave Amplification by Stimulated Emission of Radiation.

It is expected to have important applications in sending and receiving signals from satellites and other objects in space, in projecting television pictures, in photographing astronomical bodies and in medical diagnosis by X-rays or fluoroscopy. It will give a super-sharp picture heretofore unobtainable.

The optical maser, which produces a very sharply defined light beam using atomic methods, will also provide scientists with a new method for establishing standards of wavelength, for performing basic experiments in physics and for true amplification of light.

Dr. Theodore H. Maiman of Hughes Aircraft Company, Culver City, Calif., plans to report details of the optical maser in the *Journal of Applied Physics*, a publication of the American Institute of Physics.

The new atomic method for amplifying light beams was suggested early in 1959 by Dr. C. H. Townes of Columbia University and Dr. A. L. Schawlow of Bell Telephone Laboratories, Murray Hill, N. J., who this year received a patent for it.

In the Hughes device, a light source, such as a powerful flash tube lamp, irradiates a synthetic ruby crystal, shown on the

cover of this week's SCIENCE NEWS LETTER. This optical energy excites the atoms to a higher energy state, from which the energy is reradiated in a narrow band of frequencies. The excited atoms are coupled to an atomic resonator and stimulated to emit the radiation together.

In ordinary light sources, the atoms radiate individually at random and the light from such sources is therefore incoherent. The light from an optical maser is coherent.

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## BOTANY

# Magnetism Affects Plants, Russian Scientists Say

ALL LIVING THINGS have north and south poles of sorts, two Russian plant physiologists have asserted.

They have discovered that the earth's magnetic field exerts a definite effect on growth processes in plants. Establishing the existence of this phenomenon—magnetotropism—leads the Russians to believe that polarity is a fundamental property of all living material and that magnetotropism may influence cancer and radiation effects.

Magnetotropism in this case consists of the oriented growth of a root in the direction of the earth's south magnetic pole or an artificial south magnetic pole. It is similar in effect to phototropism, the attraction that makes a houseplant grow toward a sunny window.

## PHYSICS

# Zero Energy Breeder Reactor to Be Built

THE UNITED KINGDOM Atomic Energy Authority will build a zero energy fast reactor at Winfrith, England. It is called ZEBRA (Zero Energy Breeder Reactor Assembly). The reactor will permit the study of the neutron physics of a wide variety of fuel assemblies containing uranium and plutonium, which have been built up by loading fuel elements into a steel matrix.

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## MEDICINE

## Transfusion Increases Twin's Survival Chance

THE SURVIVAL CHANCES for a small, weak child in a twin birth can be greatly increased simply by holding him a few inches below the level of the delivery table.

This modified delivery technique, advanced by Dr. Melvyn Berlind, chief of obstetrics and gynecology at Unity Hospital, Brooklyn, may sound like a superstitious old-wives' tale, but it is really a means by which the twins' common placenta gives the small baby a blood transfusion.

During birth, Dr. Berlind states, the umbilical cord usually is clamped and cut immediately and the baby is handed to the nurse. In the case of twins, the obstetrician clamps and cuts the cord of the first born even more rapidly than usual in the rush to deliver the second.

The small twin's survival chances depend heavily on giving the baby as much blood as possible at the time of delivery, Dr. Berlind believes. He suggests that if the first baby is small—two to four pounds—he should be held eight to ten inches below the level of the uterus and placenta immediately after delivery and left there until pulsations in the cord stop. During this time the lightweight newborn will receive by gravity a third of a pint of blood.

If a large, strong twin comes first, the cord should be clamped immediately so the twin still in the womb can receive the extra blood, in case this second twin is small.

If both twins are large and healthy, their chances are good in the beginning. When both are small, Dr. Berlind asserts in the *Journal of the International College of Surgeons*, July, 1960, there is now a chance that at least one will live. Before, both might have died.

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## ROCKETS AND MISSILES

## Satellite to Look Like News Conference

A UNITED STATES SATELLITE being planned will look like a huge collection of photographers' flashbulb reflectors. The Air Force has contracted for a prototype solar power generator made of hundreds of small aluminum reflectors for such a satellite.

Each reflector, four inches in diameter, will focus sunlight on tiny radiation collectors in their centers. The rays will heat one end of a thermocouple device to as high as 1,000 degrees Fahrenheit.

The other end of the device may be only 400 degrees Fahrenheit. The difference in temperature will cause a flow of electrical current. The solar power generator will have no moving parts.

Under the contract with the Hamilton Standard Division of United Aircraft Corporation, the prototype will be a 100-watt model. It will later be designed as a 1,500-watt unit for satellites operating on 90-minute orbits of the earth.

The original model will have 900 reflectors that together cover an area of about 100 square feet. The individual reflectors will be assembled in groups of 28 on lightweight aluminum tubing.

The 1,500-watt generator will probably use 7,000 reflectors in 700 square feet.

It will be designed so it can be folded for storage and automatically unfolded in space. Storage batteries may be used to store electricity for periods when the satellite will be out of the sun.

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## MEDICINE

## Mass X-ray of Malaysians To Combat Tuberculosis

THE ENTIRE POPULATION of the Federation of Malaya will be X-rayed under a plan to combat tuberculosis in the country, Minister of Health, Dato Ong Yoke Lin, reported.

Drawn up on the recommendation of Sir Harry Wunderly, World Health Organization TB expert, the scheme will be launched as part of the country's second five-year plan, using several mobile X-ray units and especially trained staff.

The extent of the incidence of TB in Malaya is not exactly known, and a mass X-ray is the best way to find out, the Minister said.

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## MEDICINE

## Rabbit Serum Protects Against Poisoning

A PEDIATRICIAN has successfully used a serum from certain strains of rabbits to treat patients with atropine poisoning, which accounts for many childhood accidents.

The victims, almost always under four years old, are poisoned by cold tablets and other adult medications they find and eat or by plants such as deadly nightshade, henbane and jimson weed.

Dr. Harry C. Shirkey, director of the Children's Hospital at Birmingham, Ala., treated the patients. Dr. Shirkey worked with Dr. Gilbert C. Schmidt, Gary Flamm and Leroy Honkomp, all of the University of Cincinnati in Ohio, in developing the serum.

The scientists believe enzymes in the rabbit serum are responsible for its protective effect. Since several animals are thought to be immune to poisons that would kill children, the scientists anticipate the possibility of using animal sera, animal parts or extracts of animals for antidotes for other poisons.

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## GEOPHYSICS

## Unusual Solar Event May Upset Radio Theory

AN UNUSUAL EVENT on the sun more than a year ago is still under intensive study by members of a solar research group at the National Bureau of Standards Boulder Laboratories in Colorado. An

extremely severe radio blackout of long duration occurred, and large radio noise outbursts were heard on a number of wavelengths, beginning at 4:30 p.m., Universal Time, June 9, 1959.

However, no solar flare could be seen on the sun's disk, although a prominent flare would normally be apparent at the time of such a radio disturbance. This unusual occurrence caused Bureau scientists to question previously established relationships between solar events, ionospheric disturbances and geomagnetic storms.

The understanding of these relationships plays an important part in the Bureau's radio propagation prediction services, on which intercontinental communications by shortwave radio are based.

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## ANTHROPOLOGY

## Man and Wolf Have Much in Common

THE BEAST IN MAN may be more wolf than ape, Prof. Marston Bates, University of Michigan zoologist, has suggested.

At least, according to Prof. Bates, man appears to have more social behavior traits in common with wolves than with apes.

Man and the wolf both are hunters, the zoologist observed. Apes and monkeys largely are vegetarians.

Like man, "wolves are good family members," and even help take care of their offspring. Among monkeys, the female bears the burden of rearing their progeny.

Men and wolves associate in groups larger than the family. With wolves, it is the pack. With men, it may be a fraternal club.

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## MEDICINE

## Electronic Monitor Alarm Checks Baby's Breathing

THE FIRST FEW DAYS OF LIFE, when breathing difficulty or failure can result in quick death, no longer need be so dangerous, thanks to an infant respiratory monitor developed in South Africa.

In the monitor arrangement, a lightweight detector strapped to the baby's upper abdomen is connected to a transistorized alarm hooter. If breathing stops for 15 seconds, the alarm goes off, summoning an attendant who gives emergency treatment.

Dr. W. E. B. Edge of Durban, Natal, who originated the idea, says the monitor can be particularly valuable for premature babies and for babies with cerebral irritation or any form of respiratory difficulty. At present such infants are sometimes watched by special nurses, but such nurses are not always available.

Dr. Edge reports in the *Journal of the Lancet*, 1:1330, 1960, that the monitor made for him by W. L. Eaton of Durban has proved efficient and reliable during a six-month trial. On several occasions it has warned a special nurse, watching a baby, of an oxygen deficiency attack she herself had not detected.

Science News Letter, July 23, 1960



## MEDICINE

# Cancer Victims Speak Again

About 2,650 men and women each year are learning to speak again after operations for cancer of the larynx. These hoarse-voiced persons help each other through Lost Chord Clubs.

By FAYE MARLEY

REMOVAL OF A CANCEROUS LARYNX doomed a patient to a life of silence until in the 1920's a Pennsylvania Dutchman, recovering from a laryngectomy, discovered the use of the burp.

He was sitting silently at dinner with friends, enjoying a hearty meal, when without warning he made a social blunder. He decided that if he could burp without a larynx he could control and direct the sound into speech—and he did.

The burp technique in esophageal speech is based on swallowing air to a point in the esophagus where it can be forced back up to vibrate against the muscles and walls of the esophagus and pharynx to produce low-pitched sounds. Words can be spoken in the usual way, by movements of the tongue, palate, lips and teeth.

The Pennsylvania Dutchman and others had to teach themselves to speak. Even with the best teachers, forming the sounds "ba, be, bi, bo, bu"; the troublesome "la," which on lazy tongues comes out "kla"; and the most difficult "h" require long hours of practice.

A relaxed atmosphere for this speech practice is afforded today by the 54 Lost Chord Clubs in the United States and Canada, local chapters of the International Association of Laryngectomees (IAL) sponsored by the American Cancer Society. These clubs help to reassure patients who have undergone or are about to undergo a laryngectomy that they may be able to speak again. Several members may serve as speech therapists.

## First Voice Institute

But unfortunately only about half of the 16,000 to 19,000 laryngectomees in the U. S. have learned to speak again. Many have not had qualified teachers. Because of this shortage the IAL has organized its first voice institute (July 18-Aug. 4) at the St. Louis Central Institute for the Deaf.

Grants totaling \$13,500 from the Government's Office of Vocational Rehabilitation and the American Cancer Society will make possible traineeships for 20 new teachers in the esophageal speech fields. One full-time speech therapist could, in one year, teach 100 laryngectomees to talk.

On the faculty of this institute will be one of the outstanding teachers of the nation, Mrs. Mary Doehler, who lost her larynx to cancer 15 years ago. She now teaches in Boston six and a half days a week, with night and Saturday work in other New England areas.

"I tell the patient he will be without his voice for a short time, but that he will speak again—and just as soon as he himself determines," she says.

The lessons should begin 24 hours after the drainage tube is removed from the stoma (a hole left in the front of the neck).

"I use my hands in teaching four simple things," Mrs. Doehler explains:

1. "Open the mouth (and my hand is my mouth as I open it to show the procedure) to let the air go in.
2. "Close the mouth (and here I close my hand).
3. "Swallow the air as you would swallow a drink of water, with complete relaxation.
4. "Open the mouth and say 'ba'."

After the "ba," which is easily made with the lips, Mrs. Doehler has the pupils say "ma," also a lip sound.

The "s" is difficult for those with false teeth, but it can be mastered with practice.

It is Mrs. Doehler's belief that only a laryngectomee can teach another laryngectomee. But speech pathologists and therapists are divided on this point. Many teach who have natural voices.

One point on which all doctors seem to agree is that in the case of the operation for cancer of the larynx, the patient should be told what he has.

Dr. James J. McFarland Jr. of the Washington Hospital Center, Washington, D. C.,

says the laryngectomee should know what to expect. He can be told, not bluntly but honestly, that his voice box will be gone when he wakes up from the anesthetic.

Dr. Rex V. Naylor, speech pathologist at the Forest Glen (Md.) Annex of the Walter Reed Army Medical Center, says the greatest hurdle his patients have is learning to take in the air properly. The speed with which they learn to speak varies. Some are successful in 13 or 17 hours, while others may take a period of months. If they have not begun to talk at the end of three months, Dr. Naylor recommends one of four complex mechanical aids.

## Devices Discouraged

However, these mechanical devices are frowned upon. Although only one hour is required to learn to speak through one, the disadvantages are many. The devices are expensive, difficult to keep clean and the three of them which have batteries are subject to failure when their batteries run down. The monotonous sound produced can never approximate the human voice.

An outstanding member of the Washington club is the Rev. Dr. E. Felix Kroman, rector of St. Alban's Episcopal Church. He conducts small parts of the church services and gives prayers in spite of a recent laryngectomy.

"It took me five or six weeks before I could say much," Dr. Kroman says.

At least ten times more men than women are operated on for removal of the larynx. In most cases, they are heavy smokers.

No reason has been definitely pinpointed for contracting the cancer, however.

Science News Letter, July 23, 1960



**SWALLOWING AIR**—This exaggerated pose of Capt. John W. Jamison, U. S. Navy, Retired, demonstrates a first step in learning to talk without a voice box. With him is Mrs. Mary Doehler, who is director of esophageal speech at the Massachusetts Eye and Ear Infirmary, Boston.

## TECHNOLOGY

## Tube Can Convert Heat Directly to Electricity

ELECTRICITY for future space vehicles may be produced directly from the heat of the sun or ordinary fuels by a new electronic tube.

The tube, known as a thermionic energy converter, has been made at the Radio Corporation of America Laboratories in Princeton, N. J., under a contract supported by the Advanced Research Projects Agency of the Department of Defense.

The device has been used in the laboratory to produce a watt of electricity. Future devices are expected to be capable of use as power generators in submarines, aircraft, missiles, space vehicles and perhaps the home and car.

The present device has an efficiency up to 14%.

The experimental tube was developed by Dr. Karl G. Hernqvist of RCA's technical staff. It is capable of generating either direct or alternating current at frequencies up to about 1,000,000 cycles per second, meaning that its power output could be suited to drive virtually all types of electrical equipment.

According to Dr. Hernqvist, such units could be fabricated in various forms and arrangements to produce whatever level of power might be required.

Science News Letter, July 23, 1960

## MEDICINE

## AHA Changes Smoking, Heart Disease Position

THE AMERICAN HEART ASSOCIATION has changed its stand on a link between smoking and heart disease from a 1957 statement of "not enough evidence" to one of "maybe." Taking the new position in the Journal of the American Medical Association, 173:1130, 1960, AHA says statistics showing that coronary heart disease death rates among middle-aged men are 50% to 150% higher among heavy smokers than among non-smokers do not prove smoking causes heart disease. But the data "strongly suggest" that heavy cigarette smoking may add to or speed up the onset of coronary heart disease, AHA says.

Science News Letter, July 23, 1960

## TECHNOLOGY

## Hydrofoil Ferry Begins Venice Service

AN ITALIAN FERRY, using a hydrofoil hull, is now in service between Venice and Trieste, across 80 miles of sea. The ferry, "Freccia dell' Adriatico," built by Leopoldo Rodriguez at Messina, is a new departure in fast passenger-carrying ships.

Operated by the Societa Aliscaf, the ferry runs twice daily in each direction. The vessel is equipped with a 1,500-horsepower Mercedes motor. The power developed is such that the ferry rises out of the water within a few yards of "take-off," then skims the surface on the hydrofoils at an

average speed of 40 to 45 knots, there being a clear space of about 24 inches between the hull and the surface of the water.

The ferry carries 76 passengers in aircraft-type seats, and covers each 80-mile trip in a scheduled two hours.

Although the new service has only been in operation for a few weeks, its success has already brought contracts for similar Italian-built hydrofoils for ferry services in Norway and Finland.

Science News Letter, July 23, 1960

## PUBLIC HEALTH

## Milk Still Best Food Despite Strontium-90

MILK IS STILL a most satisfactory protective food, regardless of concern about its strontium-90 content. In fact, Nutrition Reviews, 18:197, 1960, reports that milk actually protects against strontium-90 accumulation in the bone.

"The reports released by the U. S. Public Health Service of gradually increasing levels of strontium-90 in milk have led to increasing concern on the part of both professional and lay persons," the magazine says.

But a survey by Dr. Bruce L. Larson, assistant professor of biological chemistry, department of dairy science, University of Illinois, gives strong support to the claim that milk is still man's most satisfactory food, not only in terms of nutrition but in preventing strontium-90 accumulation in the bones of our population.

The survey is reported in the Journal of Dairy Science, 43:1, 1960, in which Dr. Larson says evidence now indicates that people in the "primary milk-consuming areas" are getting relatively lower levels of strontium-90 in their bones than people in the primary "plant-consuming areas." This is attributed to the high calcium level in milk.

Dr. Larson says in the Journal "it may be just as wise to increase milk consumption as to try to remove the strontium-90 from the milk."

Science News Letter, July 23, 1960

## ZOOLOGY

## Fish Mating Calls Have Local Twang

FEMALE FISHES produce mating sounds or calls that are characteristic not only of their species, but also of their geographic location. University of Texas graduate student E. A. Delco Jr. has reported that a male fish recognizes the call of a female of its own species and responds to it when given a choice between its own and another species.

This "isolation mechanism" may be one reason why different fish species do not usually interbreed. The regional accents were discovered by Mr. Delco in "red horse" shiners, a species of carp. He said those found in the Colorado River near Austin, Tex., have love songs that sound different from those of the same species 100 miles east in the Brazos River.

Science News Letter, July 23, 1960

# IN SCIENCE

## ELECTRONICS

## New Devices May Reduce Television's Cost, Size

A LITTLE RADIO made of two tiny new devices called "compactrons" sounds as good as a fair-sized table radio.

General Electric Company said the radio compared favorably with a five-tube radio, and surpassed a seven-transistor radio.

The compactron is a tiny, single unit that can perform electronic functions now done by as many as three separate electron-control devices. Company engineers said the device's multi-function operation and small size would help make color television less bulky and less expensive. Ten compactrons could replace 15 tubes and three diodes or 24 transistors and 11 diodes used in modern sets.

The compactrons, which look like conventional tubes, are now in pilot production at the GE electronic components plants in Owensboro, Ky.

Science News Letter, July 23, 1960

## ROCKETS AND MISSILES

## Pioneer V Model Plays "God Save the Queen"

A VERY EXACT five-inch model of the Pioneer V probe, silver in color, marks a program of British-American cooperation which permitted the establishment of a communication record of 22,500,000 miles. The model contains a musical box which, when wound up, plays the British national anthem, "God Save the Queen."

The musical model was presented by the National Aeronautics and Space Administration to Prof. Alfred C. B. Lovell, director of the Jodrell Bank Experimental Station just south of Manchester, England, after a meeting with President Eisenhower.

Jodrell Bank was in contact with Pioneer V for the first 22,500,000 miles of its trip round the sun. The only other radio telescope in contact with the probe was at South Point, Hawaii. It was only able to maintain good contact for the first five or six million miles.

The radio telescope at Jodrell Bank was originally built, mostly with British Government money, for the department of radio astronomy at the University of Manchester, but has recently played an important role in the tracking of both American and Russian satellites. It is, at present, the largest of its kind in the western world. Its bowl is movable and measures 250 feet in diameter.

In the future, however, the United States will not have to enlist outside aid in its space program. The Naval Research Laboratory has announced that it has under construction at Sugar Grove, W. Va., a 600-foot-diameter radio telescope.

Science News Letter, July 23, 1960



# NE FIELDS

## METALLURGY

### Scientist Probes Alloy Behavior

THE DISTRIBUTION OF ELECTRONS in solid alloys consisting of one metal dissolved in another—a mystery whose unraveling might lead eventually to production of stronger metals—has puzzled scientists for years.

Dr. T. J. Rowland of the Metals Research Laboratories of Union Carbide Metals Company recently took an important step toward solving this mystery. He studied how closely the electrons that accompany solute atoms surround these atoms in solid solution. By observing the effect of the alloying on the nuclear resonance of copper, Dr. Rowland has been able to determine how these extra electrons are grouped around the solute atoms.

Nuclear resonance is the result of the absorption of energy by nuclei from a radio frequency electromagnetic field. The amount of energy absorbed at any particular frequency depends in turn upon the electron distribution. The resonance amplitude of copper undergoes a sharp reduction upon alloying. Its dependence upon solute valence and size argues decisively in favor of conduction electron charge redistribution as the dominant source of the electric field gradients surrounding these solutes.

Dr. Rowland's results, combined with a theory developed by W. Kohn and S. H. Vosko of Carnegie Institute of Technology, have shown that the electrons form a diffuse cloud around the solute atoms. The charge density in the cloud decreases about in proportion to the reciprocal cube of distance from the solute atom rather than exponentially; thus its effects are of longer range than had been supposed.

This work is part of a concerted study of various aspects of the fundamental structure of metallic solid solutions.

Science News Letter, July 23, 1960

## MEDICINE

### Chickenpox Can Kill Adults, Physician Warns

CHICKENPOX, usually a mild childhood disease, can kill adults. A Texas physician has just reported four deaths from chickenpox complications.

In the adults the disease became disseminated and the lungs were affected.

Dr. Stewart A. Fish of Dallas, reporting in the Journal of the American Medical Association, 173:76, 1960, says chickenpox, which is "usually a mild childhood disease, may cause severe systemic complications and death in adults."

He says the lungs are almost always involved and that other vital organs, including the brain, kidneys and liver, may be affected. The death rate has been esti-

mated at between 10% and 30% for patients with such disseminated chickenpox.

At present, there is no drug therapy available that will cure the disease or modify its course once the lungs and other viscera are involved.

Awareness of the danger is important, as early diagnosis may be a means of preventing dangerous complications.

The doctor makes a plea for earlier hospitalization of patients with disseminated chickenpox. His four patients were not hospitalized until they were desperately ill.

Dr. Fish says routine X-rays should be performed on all adult patients with chickenpox.

Science News Letter, July 23, 1960

## ARCHAEOLOGY

### Roman Ruins Cover Phoenician Remains

ARCHAEOLOGISTS have found the remains of an early Phoenician colony buried under the ruins of a monumental Roman city at Leptis Magna on the northern coast of Africa, 75 miles east of Tripoli in Libya.

Representatives of a University of Pennsylvania Museum expedition announced in Philadelphia that the group has found parts of walls of a public building and Greek pottery dating back to 600 B.C.

Phoenicians inhabiting what is now Lebanon established trading posts at places such as Carthage, Utica and Cadiz. Pressure from the Assyrians to the east forced the Phoenicians to expand their western Mediterranean trading posts into Punic colonies during the ninth and eighth centuries B.C.

Science News Letter, July 23, 1960

## PUBLIC HEALTH

### Radioactivity Reports To Be Made Public

PUBLIC REPORTS OF RADIOACTIVITY data collected in the vicinity of major Atomic Energy Commission installations will be made regularly, the AEC has announced. The initial group of reports, covering the first three months of 1960, will become available this month. Wider coverage and greater uniformity in methods of presenting the data are expected as the program develops.

Quarterly and annual summary reports of environmental radioactivity data will be provided by the Commission's contractors to the AEC area or operations offices. The operations offices will provide these reports and summaries to the Commission for transmittal to the U. S. Public Health Service. Copies of the reports also will be made available to interested groups or individuals on request.

The data are produced from routine monitoring programs around Commission plants and laboratories where operations are of such nature that plant perimeter radioactivity monitoring surveys are required. This monitoring is done in order to check controls and determine effect, if any, upon surrounding areas.

Science News Letter, July 23, 1960

## AERONAUTICS

### Planes to Broadcast Education Programs

TWO PLANES will be equipped to transmit television signals to a six-state Midwest area for the world's first airborne educational TV system.

The Midwest Council on Airborne Television Instruction awarded the \$2,200,000 contract for equipment to the Westinghouse Electric Corporation in Baltimore, Md. The program, scheduled to get under way on Jan. 30, 1961, will be beamed to Illinois, Indiana, Kentucky, Ohio, Michigan and Wisconsin.

Equipment for each plane will include two television transmitters capable of broadcasting signals to schools within a radius of 150 to 200 miles. When in service, a plane will circle at an altitude of 23,000 feet in the vicinity of the community of Montpelier in north central Indiana.

The transmitters will function as individual television stations in the air, broadcasting from two different channels or frequencies.

Science News Letter, July 23, 1960

## ASTRONOMY

### Call for Fallen "Stars" Issued by Smithsonian

A CALL FOR FALLEN "STARS," meteors that have survived their passage through the earth's atmosphere, has been issued by the Smithsonian Institution.

The meteorites are badly needed for a variety of scientific research problems, since these "rocks from space" are the only samples available on earth of extra-terrestrial material.

The Smithsonian has agreed to serve as a central agency for a continent-wide collecting program. It will investigate all reported falls, encourage active search for meteorites, inform interested scientists when new material is available, distribute samples for research and keep accurate records.

Any information concerning recent meteorite falls should be sent to Dr. F. L. Whipple, director of the Smithsonian Institution Astrophysical Observatory, Cambridge, Mass., or E. P. Henderson at the Smithsonian's National Museum in Washington.

It is hoped that the new program will increase the number of meteorite falls available for research from one per year to five or more falls per year.

Science News Letter, July 23, 1960

## TECHNOLOGY

### Temperatures of Furnace Hotter Than Sun's Surface

TEMPERATURES nearly three times that of the sun's surface can be produced by a furnace at the Naval Ordnance Laboratory, White Oak, Silver Spring, Md. The electric arc furnace is being tested for use in the study of new materials for rockets. Its electric arc can generate temperatures up to 27,000 degrees Fahrenheit.

Science News Letter, July 23, 1960

## ASTRONOMY

# Jupiter, Saturn Shine in South

Two bright planets, Jupiter and Saturn, join the stars for a fine evening show. Also brightening August skies is a meteor shower, due about the eleventh.

By JAMES STOKLEY

THE EVENING SKIES of summer generally are not as spectacular as those of winter because there are not as many bright stars in the part of the sky now visible. But this August there is a display that rivals a January evening at its best, for two bright planets have joined the stars.

The planets are Jupiter and Saturn. Their positions are shown on the accompanying maps, which depict the skies as they look about 10:00 p.m., your own kind of standard time (add one hour for daylight saving time) at the first of August, an hour earlier at the middle and two hours earlier at the end of the month.

Jupiter is the most prominent, with a brightness of minus two on the astronomer's scale of magnitude. It stands in the constellation of Ophiuchus, the serpent-bearer. To the right is Scorpius, the scorpion, which extends to the curved line of stars just below Jupiter. Antares, distinctly red in color, is the brightest star in the group. Although a first-magnitude star, it is only about a fifteenth as bright as Jupiter.

To the left of Jupiter is the constellation of Sagittarius, the archer. While it takes a vivid imagination to see his figure, the stars of this group do form a rather good teapot. Its spout comes close to Jupiter and its lid is a little farther to the left. Still farther are the four stars that mark the handle, and to the left of them shines the other planet, Saturn. Its magnitude is 0.4, somewhat brighter than Antares, but less than a quarter as bright as Jupiter.

Almost directly overhead, for the times of the maps, is another star of the first magnitude: Vega, in Lyra, the lyre. Just below it, toward the east, is Cygnus, the swan, with the star called Deneb. This is shown on the map of the northern half of the sky. And high in the south, between Cygnus and Sagittarius, flies the eagle, Aquila. In this is still another first-magnitude star, Altair.

## The Pointer Stars

To the northwest is the most familiar of all star groups, the great dipper, which is part of Ursa Major, the great bear. In the bowl of the dipper, which is downwards, are the two stars known as the pointers. Upwards and to their right is Polaris, the pole star. This is at the end of the handle of the little dipper which, in turn, is part of Ursa Minor, the lesser bear.

By following the curve of the big dipper's handle toward the west, the last of our first magnitude stars now visible can be found. This is Arcturus, in Bootes, the bear-driver.

Directly west of Lyra is the large constellation of Hercules, which represents the famous strong man of mythology. To his west is a little semicircle of stars: Corona, the crown.

And between Cygnus and Aquila are two interesting small constellations. One is Delphinus, the dolphin, formed of five rather faint stars. This group is sometimes called "Job's Coffin." The other, to the right, is Sagitta, the arrow. It is composed of four faint stars that really are arranged in the figure of an arrow.

An hour or so after midnight, toward the east, Taurus, the bull, rises into view. This is one of the constellations that make the summer skies so brilliant. In it now shines a third bright planet, ruddy Mars, which is about equal to Jupiter in brightness.

By looking toward the eastern horizon just as day is breaking and the sun is about to rise, around Aug. 5, Mercury may be seen. This planet is the nearest of any to the sun, and is never visible except just after sunset or, as now, before sunrise.

Venus, the only one of the naked-eye planets not mentioned thus far, is now following the sun across the sky, but it is so low in the west at sunset that it is difficult to locate.

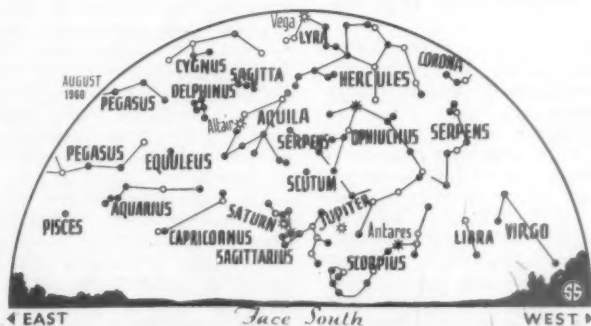
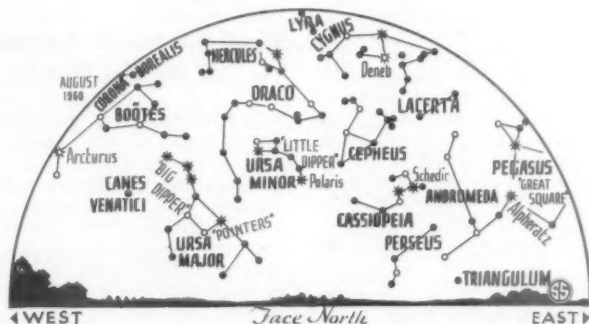
On any dark, clear night, if you watch the sky long enough, you will see a "shooting star," a moving point of light that suddenly appears and quickly vanishes. Actually it is not a star at all, but a tiny granule of cosmic dust that enters the earth's atmosphere at high speed. Then it is quickly heated by friction with the air, and there is the flash of light which you see.

## August Meteor Shower

On the average, during the year, one observer can see about seven of these meteors in an hour. But at certain times they are much more numerous, as earth encounters a meteor shower. This will occur about Aug. 11, and that night you may be able to see as many as 50 meteors an hour.

Some of these will be strays that happened to arrive at this time, but those of the shower will all seem to radiate from the same part of the sky—the constellation of Perseus—which is shown on the northern sky map, low in the northwest. Actually, these meteors are moving in parallel paths, and they seem to come together in the distance because of perspective. It is the same effect that makes the parallel tracks of a long straight railroad line seem to converge toward the horizon.

The Perseid meteors are moving around the sun in a huge elliptical orbit, in which they are quite uniformly distributed. Their orbit crosses the earth's orbit at the point



• \* • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

the earth reaches about Aug. 11. So every year, as the earth passes through the swarm's orbit, the Perseid shower appears. The meteors we see, of course, are destroyed but there are so many in the swarm that the shower will continue to appear every August for a long time to come.

There are always more meteors after midnight than before, because of the way the earth turns. If you were far away from the solar system, toward the north star, and looked toward the sun, you would see that the planets were going around the sun in a counter-clockwise direction, and that the earth itself was rotating in the same way.

That means that, from noon to midnight, we are on the rear of the advancing planet, and any meteors we see in the evening hours have to catch up to us. But in the early morning hours, we are on the front and we run into meteors. On Aug. 11 this year the moon rises in the late evening. After that, its light may keep you from seeing some of the fainter meteors.

Astronomers have made many studies to determine the speed of meteors when they catch their existence as "shooting stars." The average is about 45 miles per second, to which must be added, or subtracted, the earth's speed in its orbit around the sun. This is about 18.5 miles per second. Thus a meteor which would be seen after midnight, hitting our planet head-on, might have an apparent speed of 60 to 65 miles per second. But one that has caught up to us, seen in the evening, might seem to be moving at only 25 miles per second, which is still about 50 times the speed of a bullet from a high-powered rifle.

The faster a meteor moves, the more friction it causes as it hits air molecules. This makes it hotter, and bluer in color, as well as brighter. One that weighs only a thousandth of an ounce, coming in at high speed, might shine for a moment as brilliantly as a first magnitude star. Coming in more slowly, it might reach only the fifth magnitude, which is barely visible to the naked eye.

Dr. Fletcher Watson of Harvard University has estimated that several billion meteors reach earth every day, with the vast majority well below naked-eye visibility. Their total mass seems to be at least a thousand tons, or perhaps ten times that much. This might mean an increase in the earth's "weight" of a million tons a year.

## Celestial Time Table for August

Aug.	EST	
3	1:00 p.m.	Moon passes Jupiter
4	8:00 p.m.	Moon passes Saturn
5	2:00 p.m.	Mercury farthest west of sun; visible for a few days near eastern horizon before sunrise
	3:00 p.m.	Moon nearest earth; distance 223,500 miles
6	9:41 p.m.	Full moon
11	Early a.m.	Perseid meteors
14	12:37 a.m.	Moon in last quarter
15	9:00 a.m.	Moon passes Mars
17	8:00 p.m.	Moon farthest, distance 252,000 miles
22	4:16 a.m.	New moon
29	2:23 p.m.	Moon in first quarter
30	7:00 p.m.	Mercury behind sun
	8:00 p.m.	Moon passes Jupiter
Subtract one hour for CST, two hours for MST and three for PST.		

Science News Letter, July 23, 1960

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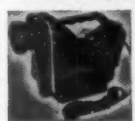
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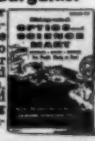
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**ADVANCED ALGEBRA, Part I**—E. A. Maxwell—Cambridge Univ. Press, 311 p., \$2.75. Emphasizes the logical structure of algebra and offers large number of routine examples.

**BIOLOGICAL AND CHEMICAL CONTROL OF PLANT AND ANIMALS PESTS: Symposium, December 1957**—L. P. Reitz, Ed.—Am. Assn. for the Advancement of Science, 273 p., illus., \$5. Scientist's report on what has been accomplished in insect and weed control through chemical and biological means, some of the consequences of it and some hints of what more may be done.

**A BOOK OF TONGUES**—Anne Welsh Guy—Steck, 48 p., illus. by Elizabeth Rice, \$1.75. Tells young children how various animals use their tongues, from cats and giraffes to hummingbirds and bees.

**CEYLON: A World Background Book**—Christine Weston—Scribner, 162 p., photographs, \$3.95. Introduction to contemporary life, work and customs of the Ceylonese who inhabit the tropical island only 22 miles from the southern tip of India.

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**Peace Prize**—Edith Patterson Meyer—Little, 216 p., illus. by Eric von Schmidt, \$3.50. Short biographical sketches, pointing out the different ways in which men have worked for peace.

**COMMONSCIENCE IN EVERYDAY LIFE**—O. A. Battista—Bruce Pub., 115 p., illus., \$2.75. Popular discussion of how to apply generally known scientific facts to situations around the home, on the job, to improve our health, prevent accidents and overcome superstition.

**COSMIC RADIO WAVES**—I. S. Shklovsky, transl. from Russian by Richard B. Rodman and Carlos M. Varsavsky, foreword by Bart J. Bok—Harvard Univ. Press, 444 p., illus., \$12.50. Comprehensive treatment of the radio emission from objects located far beyond the solar system, by leading Russian theoretical astrophysicist.

**DICTIONARY OF NUTRITION AND FOOD TECHNOLOGY**—Arnold E. Bender—Academic, 143 p., \$5.80. Brief descriptions of 2,000 terms commonly met with in discussions on nutrition, food manufacture, biochemistry and bacteriology related to food.

**EMOTION AND PERSONALITY, Vol. I: Psychological Aspects. Vol. II: Neurological and Physiological Aspects**—Magda B. Arnold—Columbia Univ. Press, 296 p., 430 p., \$7.50 each. Psychologist's attempt to survey the area of emotion, demonstrating the theory that "a phenomenological analysis of emotional experience can guide us in identifying the brain structure and pathways that mediate feelings and emotions."

**HIGH SPEED WING THEORY**—Robert T. Jones and Doris Cohen—Princeton Univ. Press, 243 p., illus., paper, \$2.95. Fundamental considerations in the development of wings for high speeds, aerodynamics of thin wings at subsonic and at supersonic speeds.

**HIGHER APPROXIMATIONS IN AERODYNAMIC THEORY**—M. J. Lighthill—Princeton Univ. Press, 147 p., paper, \$1.95. Treats subsonic flow, supersonic two-dimensional airfoil theory, supersonic projectile theory and supersonic three-dimensional wing theory.

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**NUCLEAR FLIGHT: The United States Air Force Program for Atomic Jets, Missiles and Rockets**—Kenneth F. Gantz, Ed.—Duell, 216 p., illus., \$4. Official progress report on principles, prospects and development of nuclear propulsion for aircraft, missiles and space rockets. Discusses status of different projects, the human element and operational hazards.

**OCEANOGRAPHY 1960 to 1970: 4—Oceanographic Research for Defense Applications**—Nat. Acad. of Sciences—Nat. Research Council, 16 p., paper, free upon request direct to publisher, 2101 Constitution Ave., N.W., Washington, D.C.

**ON POPULATION: Three Essays**—Thomas Malthus, Julian Huxley and Frederick Osborn, introd. by Frank W. Notestein—New Am. Lib., 144 p., paper, 50¢. Three analyses of the crisis posed by the population explosion, first put forth in 1830, in 1955 and in 1960, respectively.

**ORCHIDS OF PERU**—Charles Schweinfurth—Chicago Natural Hist. Mus., 252 p., illus. by author, paper, \$4.50. Includes descriptions of 56 genera, with many pen drawings by the author.

**PHYSICS IS FUN: Games and Experiments Not Requiring Special Apparatus**—Gerhard Niese, transl. from German by Donald Iowa Mitchell—Astro-Computing Bks., 150 p., illus., \$2.95. Seventy-eight simple experiments for boys and girls, demonstrating basic laws of physics in the four branches: mechanics, heat, sound and light.

**PLANT PHYSIOLOGY: A Treatise, Vol. II: Cellular Organization and Respiration**—F. G. Steward, Ed.—Academic, 331 p., illus., \$13. Authorities in the field analyze present knowledge about the plant cell and its inclusions: proteins, enzymes and the mechanism of enzyme action; and the oxidation of organic compounds by molecular oxygen.

**PROGRESS IN CRYOGENICS, Vol. 2**—K. Mendelssohn, Ed.—Academic, 280 p., illus., \$11.50. Summarizes methods and techniques of low-temperature technology, such as storage and handling of cryogenic liquids, low-temperature bubble chambers, the three-level solid state maser and methods of nuclear orientation.

**PSYCHOLOGY AND RELIGION**—Carl Gustav Jung—Yale Univ. Press, 131 p., paper, 95¢. Discusses the religious symbolism of unconscious processes and the possible continuity of religious forms that have appeared and reappeared through the centuries.

**THE RADIO NOISE SPECTRUM**—Donald H. Menzel, Ed.—Harvard Univ. Press, 183 p., illus., \$7.50. Deals with the important problem of radio noise—its sources, whether man-made or natural—over the known range of frequencies. Individual chapters cover meteor scatter, whistler-made propagation, solar whistlers, interstellar hydrogen and cosmic radio noise.

**ROCKETS THROUGH SPACE**—Lester del Rey—Fawcett, rev. ed., 192 p., illus., paper, 50¢. Reprint of Winston publication first printed in 1957. About man's preparations to explore the universe.

Science News Letter, July 23, 1960

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**BABY BOTTLE CADDY**, a soft washable plastic harness, holds baby's bottle securely within his reach while preventing him from throwing or dropping it. The harness is slipped over the baby and fastened in back. After feeding it can be adjusted to hold a toy.

Science News Letter, July 23, 1960

**NO-ICE WATER CIRCULATOR** prevents water from freezing around a dock or pier. Placed in the deepest part of the off-shore water, a propeller encased in a circular filter moves warm, dense sub-strata water to the surface to melt ice or prevent freezing.

Science News Letter, July 23, 1960

**NEST OF KEYHOLE SAWS** has three interchangeable blades and a quick-change locking head which holds the blades in eight positions. They cut wood, metal lath, steel, plastic and asbestos board, and can be used for sawing curves, circles, in and out of corners and flush to a wall.

Science News Letter, July 23, 1960

**TANNING HATS**, shown in the photograph, are made of a plastic that absorbs some of the burning ultraviolet rays. The manufacturer says that as long as the



wearer stays in the shadow of the hat sun-burning will be retarded, while enough sun will get through to produce a tan. Made by a vacuum forming process, the hats are available in a wide range of colors.

Science News Letter, July 23, 1960

**RIBBED NURSING NIPPLE** has hollow side ribs that give the nipple a snug, mouth-

fitting shape and permit a continuous flow of formula. Air swallowing and drooling are reduced. The supporting ribs protect against collapse so the nipple can be made of softer, more pliable rubber.

Science News Letter, July 23, 1960

**CHARCOAL STARTER POT** produces red hot coals for starting barbecue fires in 12 minutes. The lighter is filled with charcoal and plugged into an electric outlet. In a few minutes the charcoal is hot and ready to be put into a charcoal grill.

Science News Letter, July 23, 1960

**STAIN-RESISTANT TABLECLOTH** is chemically treated to resist and prevent stains. The chemical gives each fiber an invisible coating. The tablecloth repels oil-borne and water-borne stains, and needs less laundering than an ordinary cloth. The cloths are available in various colors and sizes, with matching napkins.

Science News Letter, July 23, 1960

**TOY AIR CAR KIT** produces a plastic model of future transportation. The toy rides on an invisible cushion of air created by an electric motor within the car itself. Operated by a hand trigger control cell, the car rises, hovers and darts on command.

Science News Letter, July 23, 1960



## Nature Ramblings



### By HORACE LOFTIN

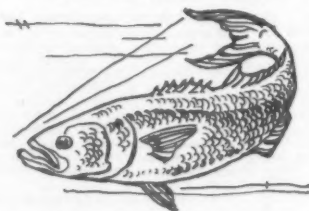
MAN, THE HUMAN ANIMAL, differs from his fellow creatures in a multitude of ways. One of the chief differences is the great degree to which *Homo sapiens* has been able to alter his natural environment.

When some caveman first donned an animal skin to protect himself from the Ice Age cold, he modified his environment as no other creature had ever done before. Such an ability to change our surroundings has led to our present age of dense populations, cities of concrete, technical marvels—and smog and aspirin.

Certainly, civilized man could not survive in a state of unaltered nature. On the other hand, can biological man survive in an unrelieved state of asphalt artificiality?

The indications are that he cannot—or should not—divorce himself from nature for best mental and physical health. And with or without a doctor's advice, a large proportion of Americans strike out each

### Call of the Wild



year for the nation's fields and streams to renew their old alliance with nature.

A hint as to the numbers of Americans responding to nature's beckoning can be seen from a study by the U. S. Fish and Wildlife Service. Here are some rather astonishing statistics from the survey:

One out of every three households in the United States has one or more hunters or fishermen among its members. Big city dwellers include one in six families with hunters or fishermen; in small cities and towns, one in three; in rural areas, one in two.

One out of every five persons 12 years of age or older is a hunter, a fisherman or both. Fishing is most popular, with one out of every four males following Isaac Walton's lead—and a surprising one in every 11 of the ladies following her husband's or boy friend's lead to the water.

Hunting remains a man's sport, however. One in every five males versus one in every 128 females are hunters.

Big city folk get in comparatively little hunting—only two percent of the population, versus ten percent who fish. In smaller cities, some six percent hunt and 16% fish. In towns and rural areas, about 14% hunt and 21% fish.

A cash value has been put on hunting and fishing. It is estimated that some three billion dollars are spent annually for fishing and hunting in the U. S. One billion of this is for hunting, the other two billion dollars for fishing. This sum alone gives an inkling of the value Americans place on our outdoor heritage.

Science News Letter, July 23, 1960



## "Bandwagon" Is Effective After Election Is Over

THE "BANDWAGON" TECHNIQUE, credited with swinging votes to Senator Kennedy in the Democratic convention, gets whatever power it has from the American's respect for the opinion or decision of the majority.

The greatest influence of the "bandwagon" is seen after an election, not before the nomination. But after it becomes clear that one candidate has received enough votes for a nomination, other delegates will start changing their votes to show their approval of the majority decision.

On the eve of an election, voters are embroiled in the most heated arguments, apparently bitterly irreconcilable over the rival candidates. But as the sun comes up the morning after, all disagreement has vanished with the mists of dawn. Everyone supports the winner!

Whatever influence the "bandwagon" technique has before an election, or before the selection of a party candidate, is applied by convincing the voters or the delegates that some one candidate already has the majority of votes committed to him.

This influence also shows up when you hear a politician state, "I shall support whatever candidate is nominated by this convention."

This bowing to the will of the majority, which is so all-persuasive among American citizens, is not understood at all in many other parts of the world.

Science News Letter, July 23, 1960

## Do You Know

Sweden is the only Western nation giving help to underdeveloped countries in the field of birth control.

Ordinary sea winds may carry 10 to 100 pounds of salt per cubic mile of air, while storm winds carry 1,000 pounds or more.

Less than 100 years ago there were no time zones in the world; the United States now has seven time zones, including the three covering Alaska and Hawaii.

An experimental chocolate that resists melting in the hand but will still melt in the mouth is being made by adding small amounts of hydrogenated fats, such as cottonseed oil or cocoa butter.

## Questions

ASTRONOMY—What is a new method for finding the ages and distances of stars? p. 50.

BIOCHEMISTRY—What produces histamine in human cells? p. 52.

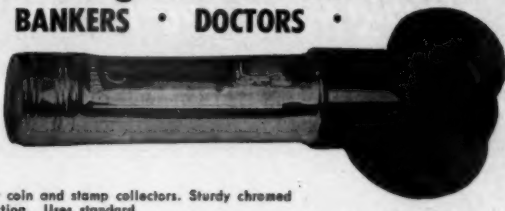
MEDICINE—By what means can the newborn weaker twin be given a blood transfusion? p. 53.

Photographs: Cover, Hughes Aircraft Co.; p. 51, Esso Research and Engineering Co.; p. 53, The Martin Co.; 54, Fremont Davis; p. 62, Eastman Chemical Products, Inc.

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